



# MODERATING EFFECT OF OPERATIONAL EFFICIENCY ON SOCIAL DISCLOSURE AND COST OF DEBT FOR LISTED NON-FINANCIAL COMPANIES IN NIGERIA

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## Abstract

*This study delves into how operational efficiency moderates the relationship between social disclosure and the cost of debt for non-financial companies listed on the Nigerian Exchange Group (NGX) from 2012 to 2024. The sample includes 61 non-financial companies. The study adopts an ex post facto design, while annual reports are sourced to collect secondary data from the sampled non-financial companies. The research further employs panel regression techniques for data analysis, and the results show that social disclosure significantly increases the cost of debt. However, the study also finds that operational efficiency reduces the cost of debt with a significant effect. When incorporating the interaction term, it shows that operational efficiency combined with social disclosure significantly decreases the cost of debt. The finding suggests that in Nigeria, social disclosure raises the cost of debt, but when combined with operational efficiency, it results in a significant reduction. The study recommends that policymakers and regulators should make sustainability standards stronger, such as social disclosure, which will give more confidence to lenders who are willing to provide loans to companies at favourable terms. Additionally, policymakers should develop sound policies to encourage company performance, and regulatory authorities should ensure that by 2030, all companies adopt sustainability reporting standards. Finally, lenders should always integrate both profitability and social disclosure in the loan negotiation process, and companies should embark on credible disclosure without compromising profitability.*

**Keywords:** *Cost of debt, Social disclosure, Operational efficiency, Non-financial companies.*

## Introduction

### Background to the study

Globally, the cost of debt continues to be a fundamental issue in strategic financial management as it affects the companies' financing decisions and capital structure. The shocking increase in the cost of debt has made it difficult for many companies to raise debt capital that will be used to overcome economic distress and finance operational activities. The rise in interest rates in many countries all over the world is a result of macroeconomic unpredictability, such as inflation and exchange rate fluctuation. In Africa, an increase in the cost of debt is often coupled with several factors, including a weak debt market and a low credit rating. In Nigeria, the cost of debt is affected by macroeconomic instability, information asymmetry, operational inefficiency, stakeholder distrust, and a low regulatory environment (Adelegan, 2020; Ofoegbu & Megbuluba, 2018). This has prompted many companies to embark on sustainability reporting, particularly social disclosure, which influences the cost of debt.

The cost of debt denotes the expenses suffered by companies in servicing their debt capital (You et al., 2025). Many non-financial companies in Nigeria have access to debt capital at a higher rate. Empirical studies like Raimo et al. (2021) report that the disclosure of social information by companies provides lenders with more confidence about credit risk. The reasoning is that social disclosure reduces the information gap and increases lenders' trust, which influences the cost of debt (Ntim & Soobaroyen, 2013). Social disclosure pertains to the reporting of a company's social performance and risk, as well as the mitigation of socially related risks. In the global debt markets, lenders use non-financial disclosure, such as social disclosure, to assess the creditworthiness of the company and maintain long-term relationships. This benefit encourages companies to fully disclose social information to access

debt capital at a cheaper rate because lenders view such companies as less risky in terms of socially related-risk (You et al., 2025).

The two basic perspectives that explain how social disclosure affects the cost of debt are the risk-mitigation and the overinvestment views. The risk-mitigation standpoint submits that socially disclosed companies are seen as less risky because their actions reduce information asymmetry and enhance lenders' confidence. Therefore, lenders are ready to provide loans to such companies at a reduced interest rate (Ofoegbu & Megbuluba, 2018). Furthermore, Raimo et al. (2021) demonstrated that social disclosure reduces the cost of debt, and this aligns with the risk mitigation view. In contrast, the overinvestment viewpoint asserts that social disclosure is cost-oriented for companies because more resources are wasted in the name of disclosure. Lenders view the social disclosure as greenwashing, reducing lenders' trust, therefore increasing the cost of debt. This has been confirmed by Zhang et al. (2024), Lavin and Montecinos-Pearce (2022), and Hamrouni et al. (2020), who found that social disclosure raises the cost of debt, supporting the overinvestment view.

Moreover, the extent to which lenders include social performance disclosure in debt negotiation depends on the company's operational efficiency because social disclosure lacks regulatory monitoring and enforcement. Combining social disclosure and operational efficiency could enhance lenders' confidence while also reducing the information gap. Operational efficiency refers to the best use of resources to reduce operating costs and maximise profit, which has become essential in enhancing the credibility of social disclosure. Wen et al. (2023) state that an operationally efficient company has the capacity to maintain profitability, manage social risk, and disclose reliable and adequate social information, which are critical factors for credit assessment. Therefore, in developing economies where profitability frequently diminishes the value of non-financial disclosure, operational efficiency may serve as a moderator to strengthen the relationship between social disclosure and cost of debt for listed non-financial companies in Nigeria.

### **Statement of the problem**

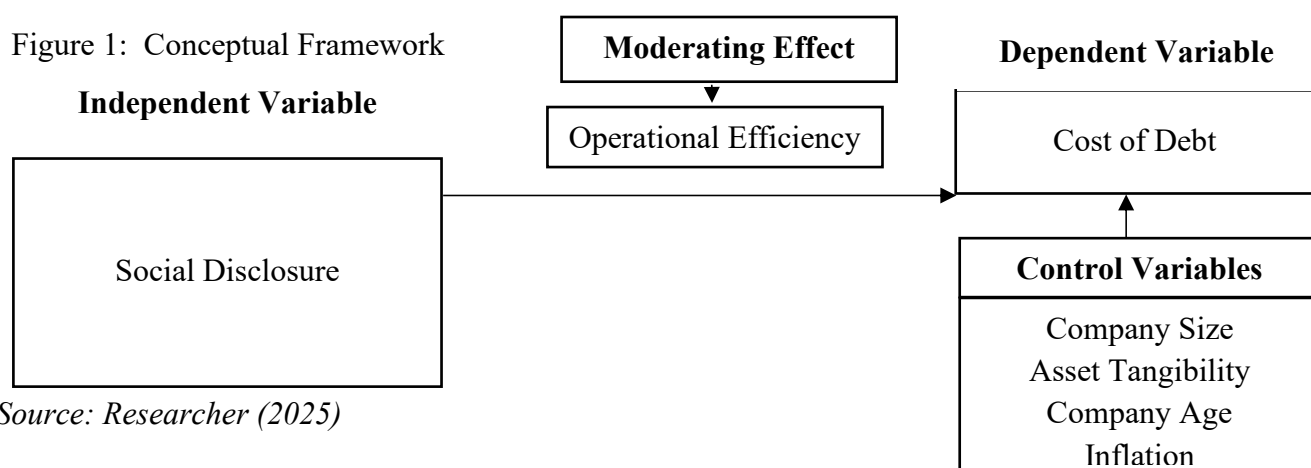
The factors influencing the cost of debt are macroeconomic volatility, the company's operational inefficiency, stakeholders' doubts, regulatory monitoring, and inadequate non-financial disclosure. Globally, empirical evidence documented that disclosure of non-financial information, such as social disclosure by companies, reduces information asymmetry and enhances lenders' confidence, therefore lowering the cost of debt (You et al., 2025). Most of this research is from countries like China (Zhang et al., 2024) and France (Hamrouni et al., 2020); there are not many studies in Nigeria where social disclosure is voluntary. Most non-financial companies in Nigeria adopt sustainability reporting standards, but with low regulatory monitoring, which makes lenders less likely to trust the social disclosure. Even though social disclosure enhances lenders' confidence and reduces information asymmetry, it is not enough when lenders want to consider it for loan negotiation in the absence of proof of operational efficiency. However, most of this research only investigates the effect of social disclosure on the cost of debt without incorporating the operational efficiency to see how it affects the relationship. Operational efficiency raises credibility of social disclosure by demonstrating effective use of resources, managerial skill, and dependable internal control systems. The interaction of operational efficiency with social disclosure assures the lenders that companies can disclose adequate social information without compromising profit, even during Nigeria's macroeconomic shock. Therefore, this highlights the need for this study to examine the effect of operational efficiency on the relationship between social disclosure and cost of debt for non-financial listed Nigerian companies. This paper is arranged around five core sections, which include introduction, literature review, methodology, results and findings, and conclusion and recommendations.

## **Literature Review/Theoretical Background**

### **Conceptual Framework**

This study structures the conceptual framework into three core parts: cost of debt, social disclosure, and operational efficiency.

Figure 1: Conceptual Framework



Source: Researcher (2025)

The conceptual framework indicates the nexus between social disclosure and the cost of debt, with operational efficiency aiding as a moderating variable. This means that the effect of social disclosure on the cost of debt may vary based on the level of the company's operational efficiency. Furthermore, the paper includes control variables to account for other factors that might influence this relationship.

Cost of debt is the interest expense a company incurs on its loans, which is affected by lenders' evaluation of company-specific risk. Lenders determine suitable interest rates by monitoring debt-related risks and using financial metrics such as solvency risk, profitability, and repayment capacity, together with the ability to renegotiate debt contracts (Erragragui, 2018). There are three measures of the cost of debt: the accounting-based method (interest expense /total debt), the rating-based measure (credit rating category), and the market-based approach (yield to Maturity (YTM), credit Spread, and marginal cost of debt) (La Rosa et al., 2018). This paper adopts the accounting-based measure because it reflects the actual cost of debt influenced by social disclosure (Shi et al., 2024).

Social disclosure is the reporting of relevant information about the company's social practices. It is the release of a company's social actions, policies, and performance regarding employees, communities, consumers, and larger societal stakeholders (Guo et al., 2024). Grey et al. (1996) state that social disclosure heightens social accountability and transparency. Social disclosure helps stakeholders to evaluate how companies handle social risks and support sustainable development (GRI, 2024). Moreover, Raimo et al. (2021) suggest that social disclosure decreases information asymmetry, promotes legitimacy, and provides insight into how companies handle socially related risks. This study measures social disclosure using indicators such as employment and labour practice, occupational health and safety, training and education, diversity and equal opportunity, human rights, local communities, customer health and safety, marketing and labelling, supplier social assessment, and customer data privacy (GRI, 2024). This study uses content analysis based on GRI standards and NGX Sustainability Guidelines, which are crucial to evaluate a company's social performance.

Operational efficiency is the effort made by companies to effectively minimise costs so that revenue will increase. When companies wisely use their resources to increase revenue, it leads to long-term financial stability (Wen et al., 2023). Operational efficiency is measured using both financial and non-financial metrics; the financial measures are operating margin, inventory turnover, and return on assets (Ross et al., 2016). This study considers return on assets (ROA) as a proxy for operational efficiency, as it may shape how social disclosure affects investors' risk perceptions and, consequently, the cost of debt. Recent studies, such as Dua and Sharma (2024), assert that companies with sufficient social disclosure reduce information asymmetry and perceived socially related risk, necessitating lenders to impose more favourable loan conditions that may lower the cost of debt. However, if a company is operationally inefficient, lenders may reject any social information that it discloses. Moreover, lenders use operational efficiency as a vital measure to assess a company's capacity for loan repayment. Companies that demonstrate high operational efficiency with adequate transparent social disclosure are anticipated to reduce lenders' perceived risk, as a result, lowering the cost of debt. This is because companies with high operational efficiency may stand a better chance of disclosing credible social information than companies with low operational efficiency. It is in this background that this



study aims to use operational efficiency as a moderating variable in the relationship between social disclosure and the cost of debt. Therefore, it is hypothesised that operational efficiency has no moderating effect on the relationship between social disclosure and the cost of debt for Nigerian listed non-financial companies.

### **Risk-Mitigating and Overinvestment Views**

Larsson and Larsson (2024) assert that the relationship between social disclosure and cost of debt can be explained from risk-mitigating and over-investment perspectives. Dua and Sharma (2024) and Apergies et al. (2022) term social disclosure as a risk-mitigating model due to its tendency to lower lenders' perceived risk, thereby influencing the cost of debt. However, Zhang et al. (2024) describe social disclosure within an overinvestment perspective, adding that spending on social activities leads to agency conflict that ultimately increases the cost of debt. Larsson and Larsson (2024) also stress that spending money on social disclosure is a waste of resources and greenwashing. This is because companies engage in too much disclosure to improve their reputation instead of serving the interests of lenders, which makes the risk seem higher. According to Hamrouni et al. (2020), social disclosure elevates the cost of debt, as lenders perceive such disclosure as potentially compromising profitability, which may lead to the company not paying debt.

### **Theoretical Background**

This study is based on two theories: signalling and legitimacy. The signalling theory, developed by Spence in 1973, posits that companies send relevant information to stakeholders to reduce information asymmetry. Social disclosure serves as a good signal to lenders regarding transparency and accountability, managerial competence, and effective risk management. Rong and Kim (2024) explain that inadequate social disclosure indicates a weak signal, increasing the cost of debt, but enough social disclosure shows a strong signal, reducing the cost of debt. However, the signal is more effective when it is conditioned by the operational efficiency of the company (Wu 2024). An operationally efficient company has the capacity to embark on transparent social disclosure, which sends a strong signal to the lenders that it can pay debt and is less risky in terms of social practices (Dua & Sharma, 2024). The credible social disclosure and high operational efficiency increase the confidence of lenders and reduce the cost of debt.

Suchman put forth legitimacy theory in 1995 by affirming that companies may disclose adequate social information to gain legitimacy from society, particularly lenders. The theory adds that social disclosure lowers information asymmetry between the lenders and the company, providing more confidence to lenders about the company's social practices, and this lowers the cost of debt (Andersson & Schwartz, 2024). When a company discloses inadequate social information, legitimacy is lost, such information cannot be used for credit negotiation, and this increases the cost of debt (Mustikawati & Purnama Siregar, 2025). However, the legitimacy is more strengthened when it is supported by the company's operational efficiency (Eliwa et al., 2021). Companies that fully utilise their resources can disclose enough information that relates to their social activities, thereby enhancing their legitimacy in society, which reduces perceived risk. Lenders see such companies as less risky in terms of operational and social performance, which may lower the cost of debt. The theory further adds that operationally efficient companies disclose their social practices to have access to debt capital at lower interest rates (Dua & Sharma, 2024). In Nigeria, where public confidence is very low, economic legitimacy and social acceptance help to reduce lenders' risk perception.

### **Empirical Review**

In this section, various empirical studies are reviewed in line with the topic under investigation. The effect of social disclosure on cost of debt, Dua and Sharma (2024), in their study, determined the effect of ESG disclosure on a company's cost of capital for 192 non-financial companies listed on the BRICS stock indexes between 2011 and 2020. The study showed that social disclosure has a negative effect on the cost of debt. Shi et al. (2024) studied the effect of ESG performance on corporate debt financing costs of listed Chinese companies between 2018 and 2020 with a sample size of 2,058 companies. The findings indicated that social disclosure lowers the cost of debt. Saputra and Rahman (2024) evaluated the impact of ESG factors on the cost of capital from Southeast Asia with a sample

size of 645 non-financial listed companies between 2018 and 2023. The study reported that social disclosure insignificantly raises the cost of debt. Rong and Kim (2024) found that social disclosure significantly increases the cost of debt, but media coverage with social disclosure significantly reduces it, when they explored the effect of ESG disclosure on the cost of debt of listed Korean companies between 2012 and 2019 with a sample size of 672 companies. Priem and Gabellone (2024) delved into the impact of ESG disclosure scores on the cost of capital among 17 countries in Europe. The sample size comprised 600 companies from 2018 to 2019, and the result revealed that social disclosure significantly reduces the cost of debt for companies in countries with poor legal frameworks. In the same vein, Guo et al. (2024) worked on the corporate social responsibility (CSR) and the cost of debt in China between 2010 and 2019 with a sample size of 20,000 firm-year observations. The study revealed that CRS significantly lowers the cost of debt because of improved legitimacy. Conversely, Andersson and Schwartz (2024), in their study, assessed the effect of ESG disclosure on the cost of debt for 220 listed Nordic non-financial companies from 2011 to 2019 to observe that social disclosure slightly increases the cost of debt, supporting the overinvestment perspective.

In their study, Fandella et al. (2023) addressed the impact of ESG disclosure on the cost of debt, cost of equity, and weighted cost of capital (WACC) in BRICS countries like Brazil, Russia, India, China, and South Africa with a sample size of 3,217 companies from 2014 to 2019. The study found the insignificant effect of social disclosure on reducing the cost of debt and cost of equity. Raimo et al. (2021) found a significantly positive relationship between social disclosure and the cost of debt for companies in the list of S&P 1200 from 2010 to 2019. Ratajczak and Mikołajewicz's (2021) study provided a nexus between ESG disclosure and the short- and long-term cost of debt. The study covered the period of 1 year, 2017, and employed a sample size comprised of 300 companies from around the globe that were approved by Corporate Knights. The empirical evidence indicated that social disclosure lowers the cost of short-term, long-term, and total debt. Hamrouni et al. (2020) studied how corporate social responsibility (CSR) disclosures affect lenders in France between 2010 and 2015. The study found that social disclosure increases the cost of debt.

The effect of operational efficiency on cost of debt, Wen et al. (2023) found that operational efficiency reduces lenders' risk perceptions, therefore lowering the cost of debt. According to other studies, operational inefficiencies are a significant barrier for non-financial companies in Nigeria, which has an influence on lenders' perceptions of risk (Adelegan, 2020). The study of Ofoegbu and Megbuluba (2018) indicated that corporate disclosures lower the cost of debt, but they stress that disclosure is insufficient on its own without operational efficiency. Despite this, limited studies assessed how operational efficiency, combined with social disclosure, affects the cost of debt. This paper addresses this gap by empirically examining operational efficiency as a moderating variable, thereby contributing new knowledge to the existing theoretical evidence.

## Methodology

The study employs an ex post facto research design within a positivist framework, fit for analysing historical data from companies' published annual reports and accounts. The sample comprises 61 out of 89 non-financial companies listed on Nigerian Exchange Group (NXG) between 2012 and 2024. The filtering sampling technique is used to determine the sample size of the non-financial listed companies and panel data regression models are used for data analysis, alongside descriptive statistics and a correlation matrix. Diagnostic tests such as normality, multicollinearity, and heteroscedasticity are conducted to ensure the data are appropriate for statistical analysis. The study also performs model specification tests, including the Hausman test and the Lagrange multiplier test, to identify the most suitable model for testing the formulated hypotheses. Data analysis is conducted using Stata 17.0, with a significance level set at 5 per cent.

## Variables Definition

This study's variables include dependent (cost of debt), independent (social disclosure), moderating (operational efficiency), and controls (company size, asset tangibility, company age and inflation). The variable codes, description, measurements and sources are presented in Table 1.

**Table 1: Variables Description and measurements**

Variable	Type	Measurements Approach	Source(s)
Cost of Debt (COD)	Dependent Variable	Interest Expenses (1-Tax) ÷ Total Debt	Dua & Sharma (2024); Ofogbe et al. (2021).
Social Disclosure (SD)	Independent Variable	Social Disclosure Index (1 for occurrence, 0 for non-occurrence) covering the 10 social indicators. Total occurrence multiplied by the Total level of disclosure.	Rong & Kim (2024); Raimo et al. (2021); GRI (2024)
Operational Efficiency(OE)	Moderating Variable	Net Profit/Total Assets.	Wu (2024)
Company Size (CSIZE)	Control Variable	Natural logarithm of the company's Total assets	Wu (2024); Luo et al. (2019).
Asset Tangibility (AT)	Control Variable	Tangible Assets ÷ Total Assets	Shi (2024); Ratajczak & Mikolajewicz, (2021)
Company Age (AGE)	Control Variable	Number of years since incorporation or listing	Wen et al. (2023)
Inflation(INF)	Control Variable	Annual Inflation Rate	Titus et al., (2023)

Source: *Researcher's Compilation* (2025)

Model Specification

$$Y = \beta + \delta (\text{Social Disclosure}) + \mu \dots \dots \dots (1)$$

Model 1: The baseline model evaluates the direct effect of social disclosure on the cost of debt:

$$COD_{it} = \beta_0 + \beta_1 SD_{it} + \beta_2 CSIZE_{it} + \beta_3 AT_{it} + \beta_4 AGE_{it} + \beta_5 INF_{it} + \mu_{it} \dots \dots \dots (2)$$

Model 2: The model tests the effect of social disclosure and operational efficiency on the cost of debt:

$$COD_{it} = \beta_0 + \beta_1 SD_{it} + \beta_2 OE_{it} + \beta_3 CSIZE_{it} + \beta_4 AT_{it} + \beta_5 AGE_{it} + \beta_6 INF_{it} + \mu_{it} \dots \dots \dots (3)$$

Model 3: The model assesses the moderating effect of operational efficiency on social disclosure and cost of debt:

$$COD_{it} = \beta_0 + \beta_1 OE_{it} * SD_{it} + \beta_2 CSIZE_{it} + \beta_3 AT_{it} + \beta_4 AGE_{it} + \beta_5 INF_{it} + \mu_{it} \dots \dots \dots (4)$$

Where:

- Y = Cost of debt (COD)
- SD<sub>it</sub> = Social disclosure of company "i" in period "t"
- OE<sub>it</sub> = Operational efficiency of company "i" in period "t"
- OE<sub>it</sub>\*SD<sub>it</sub> = Operational efficiency interaction with social disclosure of company "i" in period "t"
- CSIZE<sub>it</sub> = Company size of company "i" in period "t"
- AT<sub>it</sub> = Assets tangibility of company "i" in period "t"
- AGE<sub>it</sub> = Company age of company "i" in period "t"
- INF<sub>it</sub> = Inflation rate in period "t"
- it = Companies "i" in time "t"
- β<sub>0</sub> = Constant terms
- β<sub>1</sub> – β<sub>10</sub> = Explained coefficient of the independent variable
- μ = Error term of company "i" in period "t"

## Results and Discussion

**Table 2: Descriptive Statistics**

Variables	Obs	Mean	Std. Dev	Min	Max
COD	793	8.910441	1.060019	5.1	12.1
SD	793	.7973518	.1249466	.6	1
OE	793	.1095839	.1070328	-.08	.29
OE*SD	793	.0870416	.0874444	-.08	.29
CSIZE	793	17.03756	2.18252	8.483637	22.52039
AT	793	.4384993	.9914194	7.65e-06	19.72287
AGE	793	43.57377	19.59778	3	101
INF	793	15.04769	6.583195	8.05	31.43

Source: *Output from STATA 17.0 (2025)*

Table 2 reveals the descriptive statistics for the cost of debt (COD), with an average of 8.91 and a standard deviation of 1.06. This indicates that the difference is influenced by debt market sentiment and creditworthiness. For social disclosure (SD), with a mean of 0.80 and a standard deviation of 0.13, it indicates that differences are due to varying levels of social disclosure among non-financial companies. The operational efficiency (OE) shows a mean and standard deviation of 0.11, respectively, indicating that non-financial companies achieve an average of 11% operational efficiency, with some variation around this average. Regarding the control variables with mean values of 17.04 for company size (CSIZE), 0.44 for asset tangibility (AT), 43.57 for company age (AGE), and 15.05 for inflation (INF), the standard deviations of 2.18, 1.00, 19.60, and 6.58, respectively. This signifies that there is significant variation in asset tangibility and company age, and inflation rates also vary over the study's period.

**Table 3: Correlation Results**

	COD	SD	OE	OE*SD	CSIZE	AT	AGE	INF
COD	1.0000							
SD	0.0710	1.0000						
OE	-0.1801	-0.0251	1.0000					
OE*SD	-0.1732	0.1314	0.9755	1.0000				
CSIZE	-0.0691	-0.0342	-0.0183	-0.0264	1.0000			
AT	0.0354	-0.0028	-0.0332	0.0244	-0.0254	1.0000		
AGE	-0.1659	-0.0210	-0.0193	-0.0302	0.0740	0.0130	1.000	
INF	-0.3880	-0.0006	0.0162	0.0102	0.1064	0.0611	5	1.0000

Source: *STATA Results version 17.0*

The results in Table 3 show that the correlation coefficients of all independent variables with the dependent variable are below 80 percent (Gujarati & Sangeetha, 2007), indicating the absence of multicollinearity in the model. Consequently, the data are suitable for analysis. Moreover, the table indicates that the Cost of Debt (COD) is positively correlated with social disclosure (SD) (0.07) and asset tangibility (AT). This suggests that increased social disclosure and asset tangibility lead to higher debt costs. This aligns with the overinvestment viewpoint, which sees excessive social disclosure as a misuse of company resources, and lenders may perceive the disclosure as greenwashing. The data also show that operational efficiency (OE) (-0.18), operational efficiency with social disclosure (OE\*SD) (-0.17), company size (CSIZE) (-0.07), company age (AGE) (-0.17), and inflation (INF) (-0.39) are

related to the cost of debt. This implies that companies with higher operational efficiency and those combining social disclosure with operational efficiency tend to have lower debt costs. Additionally, larger and older firms generally benefit from a better reputation, resulting in reduced costs, while fluctuations in the inflation rate may contribute to lower debt expenses.

**Table 4: Result of Variance Inflation Factor (VIF) and Tolerance (1/VIF) Tests**

Variable	Model 1		Model 2		Model 3	
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
INF	1.04	0.965371	1.04	0.965017	1.04	0.965160
AGE	1.03	0.973919	1.03	0.973509	1.03	0.973403
CSIZE	1.02	0.983708	1.02	0.983298	1.02	0.984111
AT	1.00	0.995342	1.01	0.994306	1.01	0.994792
SD	1.00	0.998450	1.00	0.997758		
OE			1.00	0.997174		
OE*ED					1.00	0.997646
Mean VIF	1.02		1.02		1.02	

Source: STATA Results version 17.0

The Variance Inflation Factor (VIF) and Tolerance (1/VIF) tests in Table 4 reveal that VIFs were less than 10, indicating the absence of multicollinearity, with the highest VIF of 1.04 (Gujarati & Sangeetha, 2007). The three models' VIF mean values are 1.02, 1.02, and 1.02, showing that there is no multicollinearity in the models. Table 4 further presents that the 1/VIF values, which are constantly less than 1 but not near zero, show no presence of multicollinearity in the study models (Gujarati & Sangeetha, 2007). Generally, the VIF and 1/VIF tests confirm that there is no multicollinearity in models 1, 2, and 3.

**Table 5: Results of Shapiro-Wilk, Skewness and Kurtosis Test for Data Normality**

	Shapiro-Wilk Test					Skewness and Kurtosis Test			
	OBS	W	V	Z	Prob>z	-Joint Test-			
						Pr(skewness)	Pr(kurtosis)	Adj Chi2(2)	Prob>Chi2
Model 1	793	0.99782	1.113	0.264	0.39601	0.3536	0.2860	2.00	0.3678
Model 2	793	0.99782	1.113	0.264	0.39601	0.3536	0.2860	2.00	0.3678
Model 3	793	0.99782	1.113	0.264	0.39601	0.3536	0.2860	2.00	0.3678

Source: STATA Results version 17.0

Table 5 shows the results of the Shapiro-Wilk test with the p-value of 0.40 for models 1, 2, and 3, while for the skewness and kurtosis test, the p-value is 0.37 for all three models, which is greater than 0.05. This indicates that the data for the three models are normal and suitable for analysis.

**Table 6: Hausman Fixed Random Test**

	Chi <sup>2</sup> (1)	Prob>chi2	Decision
Model 1	104.29	0.0000	The FE model is better
Model 2	106.03	0.0000	The FE model is better
Model 3	106.28	0.0000	The FE model is better

Source: STATA Results version 17.0

Table 6 exhibits the Hausman test for the three models, with the Prob>chi2 values of 0.00, less than 0.05. This demonstrates that the fixed effect is appropriate for the analysis.

**Table 7: Fixed Effect (FE) Results for Model 1****Dependent Variable: COD**

Variables	Coefficients	t-value	p-value
SD	0.5617063	2.12	0.035
CSIZE	-0.0167333	-0.39	0.696
AT	-0.0515995	-1.40	0.163
AGE	-0.1399705	-10.27	0.000
INF	-0.0008903	-0.11	0.909
Constant	14.88272	17.14	0.000
R-squared (Within) = 0.2736			
R-squared (Between) = 0.0687			
R-squared(Overall) = 0.0284			
F-Statistic =54.75			
Prob > F = 0.0000			
Obs = 793			

*Source: STATA Results version 17.0*

Table 7 discloses the results of the effect of Social Disclosure (SD) on the Cost of Debt (COD) for non-financial listed companies in Nigeria. R-squared values of 27.36 percent within companies, 6.87 percent between companies, and 2.84 percent overall are consistent with You et al. (2025), who also reported a low R-square, despite the model's comparatively low explanatory power. The provided F-statistic of 54.75 percent with the p-value of 0.000 indicates that the model is better for analysis. The table further presents that social disclosure (SD) increases the cost of debt (COD) by 0.56 with a p-value of 0.00. This indicates that lenders charge companies with excessive social disclosure a higher cost of debt, as they view this disclosure as greenwashing that wastes resources. This finding corroborates the signalling theory, which states that social disclosure may be understood as a sign of increased operating costs rather than a way to mitigate information asymmetry, which prompts lenders to ask for more interest income on debt (Raimo et al., 2021). The finding also supports Rong and Kim (2024), Raimo et al. (2021), and Hamrouni et al. (2020), who reported that social disclosure significantly elevates the cost of debt, but it disagrees with Guo et al. (2024), Dua and Sharma (2024), Priem and Gabellone (2024), and Ratajczak and Mikołajewicz (2021), who showed that social disclosure significantly reduces the cost of debt. The inconsistency in the findings is because lenders in Nigeria frequently perceive subpar and laxly enforced social disclosures as overinvestment or greenwashing, particularly in high-risk industries (Rong & Kim, 2024). This leads them to rely more on financial performance, which ultimately results in higher interest rates and more expensive loan terms. Regarding control variables, company size (CSIZE), asset tangibility (AT), and inflation (INF) marginally reduce the cost of debt, but company age (AGE) significantly lowers it. The coefficient of 14.88 indicates that the combined effect of the social disclosure and control variables considerably increases the cost of debt.

**Table 8: Fixed Effect (FE) Results for Model 2****Dependent Variable: COD**

Variables	Coefficients	t-value	p-value
SD	0.5240978	2.10	0.045
OE	-1.609873	-5.22	0.000
CSIZE	-0.0125101	-0.30	0.766
AT	-0.0589846	-1.62	0.105
AGE	-0.1398414	-10.44	0.000
INF	-0.0007407	-0.10	0.923
Constant	15.01254	17.59	0.000
R-squared (Within) = 0.2998			
R-squared (Between) = 0.0713			

R-squared(Overall) = 0.0320

F-Statistic =51.81

Prob > F = 0.0000

Obs = 793

Source: STATA Results version 17.0

Table 8 reveals that the provided F-statistic of 51.81 percent and the p-value of 0.000 indicate that the study model can be used for analysis. R-squared values of 29.98 percent within companies, 7.13 percent between companies, and 3.20 percent overall are in line with You et al. (2025), who also found a low R-squared, despite the model's fairly low explanatory power. The table further presents that social disclosure (SD) increases the cost of debt (COD) by 0.52 with a p-value of 0.00. This suggests that companies that spend excessively on social disclosure are penalised with high interest rates, as lenders view it as a waste of resources. Furthermore, operational efficiency (OE) reduces the cost of debt by -1.61 with a p-value of 0.00. This emphasises that companies that efficiently use their resources to generate more income are compensated with a lower cost of debt. This signifies that lenders consider profitability as a major determinant of loan pricing decisions. Lenders view companies with high operational efficiency as well-managed companies that have the capacity to service their debt. This result supports Tanin et al. (2024) and Wen et al. (2023), who found that operational efficiency significantly reduces the cost of debt. However, Pardomuan et al. (2024) found that operational efficiency significantly increases the cost of debt. Inconsistent findings are due to differences in regulatory enforcement, sectoral dynamics, and variable measurement (Pardomuan et al., 2024). For the control variables, company size (CSIZE), asset tangibility (AT), and inflation (INF) have a slight decrease in the cost of debt, whereas company age (AGE) has a significant reduction in it. The coefficient of 15.01 shows that the combined effect of the social disclosure, operational efficiency, and control variables noticeably increases the cost of debt.

**Table 9: Fixed Effect (FE) Results for Model 3**

**Dependent Variable: COD**

Variables	Coefficients	t-value	p-value
SD*OE	-1.982456	-5.24	0.000
CSIZE	-0.0114837	-0.27	0.786
AT	-0.057381	-1.58	0.115
AGE	-0.1401306	-10.44	0.000
INF	-0.0007971	-0.10	0.917
Constant	15.42183	18.53	0.000

R-squared (Within) = 0.2957

R-squared (Between) = 0.0707

R-squared(Overall) = 0.0314

F-Statistic =61.05

Prob > F = 0.0000

Obs = 793

Source: STATA Results version 17.0

Table 9 presents the F-statistic of 61.05 percent with the p-value of 0.000, showing that the study model is good for analysis. Table 9 also discloses that operational efficiency interacting with social disclosure OE\*SD reduces the cost of debt (COD) by -1.98 with a p-value of 0.00.

This underscores that companies that efficiently use their resources to generate more revenue and, at the same time, disclose transparent social information are rewarded with a reduced cost of debt. This signifies that lenders value social disclosure and operational efficiency for loan pricing decisions. Lenders view operationally efficient companies with social disclosure as well-to-do companies that have the capacity to disclose social information without compromising profitability, which shows that servicing debt is not an issue. This finding is similar to signalling theory, which postulates that efficient companies with credible social disclosure are perceived by lenders as less risky. Additionally,

legitimacy theory submits that operationally efficient companies that transparently disclose their social information earn societal respect and have the ability to service debt. Lenders are willing to provide loans to such companies at reduced interest rates (Uyar et al., 2024). The result also agrees with Uyar et al. (2024), who reported that CSR reporting coupled with firm performance (ROA) significantly reduces the cost of debt. Therefore, the interaction of operational efficiency with social disclosure lessens information asymmetry and heightens lenders' confidence, resulting in a lower cost of debt. Concerning the control variables, company size (CSIZE), asset tangibility (AT), and inflation (INF) insignificantly reduce the cost of debt, while company age (AGE) significantly decreases it. The coefficient of 15.42 demonstrates that operational efficiency interacts with social disclosure, and control variables significantly increase the cost of debt.

## Conclusion and Recommendations

The interplay between social disclosure and the cost of debt moderated by operational efficiency is very crucial especially for listed non-financial Nigerian companies. The results reveal that social disclosure increases the cost of debt, while the combination of operational efficiency with social disclosure significantly reduces it. According to the study's findings, the operational efficiency of Nigerian non-financial listed companies has a significant impact on social disclosure. This paper adds to the existing body of knowledge by empirically indicating that lenders appreciate social disclosure based on a company's operational efficiency in the developing markets, rather than negotiating loan terms with companies based on social disclosure. The study further increases the understanding of signalling and legitimacy theories by demonstrating that social disclosure notably lowers the cost of debt when combined with operational efficiency (profitability) instead of greenwashing.

The recommendations based on the study's results are that social disclosure standards should be strengthened by policymakers and regulators like the Securities and Exchange Commission (SEC) and the Financial Reporting Council of Nigeria (FRC) in order to lower lender doubt, mitigate information asymmetry, and guarantee transparent disclosure and comparability among companies. Before making significant investments in social disclosure initiatives, companies should put first operational efficiency improvements, such as strategic resource utilization, so that lenders view social disclosure as credible signals rather than financial pressures. Recognizing that social disclosure supported by operational efficiency more accurately reflect long-term creditworthiness, lenders should incorporate both operational measures and social disclosure performance into credit evaluation models. Finally, the study shows that non-financial companies in Nigeria need to use both stronger operational efficiency and better social disclosure transparency to lower cost of debt.

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